

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: May 21, 1992

Date Submitted: May 15, 1992

Project: 7238, Acid Tank Soil, PO# M24573

**RESULTS OF ANALYSES OF THE SOIL SAMPLE
FOR TOTAL METALS BY
INDUCTIVELY COUPLED PLASMA (ICP)
METHOD 6010
Results Reported as $\mu\text{g/g}$ (ppm)**

Sample # M24573

Analyte:

Arsenic	3.6
Barium	85
Cadmium	<0.5
Chromium	13
Lead	71
Mercury	<0.5
Selenium	<0.5
Silver	1.5
Copper	110
Nickel	14
Zinc	230
Sodium	110

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Quality Assurance**

<u>Sample #</u>	<u>Method Blank</u>	<u>M24573 (Duplicate)</u>
<u>Analyte:</u>		
Arsenic	<0.5	3.1
Barium	<1.0	92
Cadmium	<0.5	0.5
Chromium	<0.5	8.4
Lead	<0.5	88
Mercury	<0.5	<0.5
Selenium	<0.5	0.8
Silver	<0.5	1.5
Copper	<0.5	115
Nickel	<0.5	12
Zinc	<0.5	280
Sodium	<0.5	110

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RESULTS OF ANALYSES OF THE SOIL SAMPLE FOR TOTAL METALS BY INDUCTIVELY COUPLED PLASMA (ICP) METHOD 6010 Results Reported as % Recovery Quality Assurance

<u>Sample #</u>	M24573 <u>Matrix Spike</u> % Recovery	M24573 <u>Matrix Spike Duplicate</u> % Recovery	<u>Spike Level</u>
<u>Analyte:</u>			
Arsenic	104%	100%	50
Barium	ai	ai	25
Cadmium	95%	97%	25
Chromium	85%	84%	25
Lead	85%	67%	50
Mercury	85%	86%	50
Selenium	95%	95%	50
Silver	71%	69%	10
Copper	ai	ai	25
Nickel	90%	89%	50
Zinc	ai	ai	25
Sodium	105%	104%	250

ai - The amount spiked was insufficient to give meaningful recovery data.

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METHOD 6010
Results Reported as % Recovery
Quality Assurance**

<u>Sample #</u>	<u>Spike Blank</u>	<u>Spike</u>
<u>Analyte:</u>	<u>% Recovery</u>	<u>Level</u>
Arsenic	107%	50
Barium	108%	25
Cadmium	103%	25
Chromium	105%	25
Lead	102%	50
Mercury	89%	50
Selenium	97%	50
Silver	69%	10
Copper	99%	25
Nickel	105%	50
Zinc	109%	25
Sodium	99%	250

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**RESULTS OF ANALYSES OF THE SOIL SAMPLE
FOR NITRATE AND FLUORIDE
Results Reported as $\mu\text{g/g}$ (ppm)**

<u>Sample #</u>	<u>Nitrate</u> (NO ₃ -as N) (ppm)	<u>Fluoride</u> (F) (ppm)
M24573	16	3.5
<u>Quality Assurance</u>		
Method Blank	<0.2	<0.2
M24573 (Duplicate)	14	4.0
M24573 (Matrix Spike) Percent Recovery	81%	80%
M24573 (Matrix Spike Duplicate) Percent Recovery	65%	57%
Spike Blank Percent Recovery	71%	71%
Spike Level	100	20

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**RESULTS OF ANALYSES OF THE SOIL SAMPLE
FOR pH**

<u>Sample #</u>	<u>pH</u>
M24573	8.8

Quality Assurance

M24573 (Duplicate)	8.8
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SAMPLE CHAIN OF CUSTODY

Company NIASKAN Copper Works Contact Gerald Thompson
Address P.O. Box 3546
City, State, Zip Seattle WA 98124
Phone # (206) 623-5800 X 218 Date 5/5/97

PURCHASE ORDER #

m 24573

PROJECT LOCATION

SAMPLE DISPOSAL INFORM

☐ Dispose after 30 days
☒ Return Samples
☐ Call for Instructions

Analyses Requested

✓ Heavy Metals (9) +
Nitric Acid +
Ammonium Bi-fluoride +
Sodium Hydroxide

Acidic	Basic
Na	NaOH
F	NH ₄ F
NO ₃	
Hungary	

adeltl test request 5/19/82 mrs
 PH per Jerry

Time

Received by:

Gerald Thompson
 M.A. DANFORS

Alaska Copper Works
FRIEDMAN & BRUYA

5/5

9:15

5-15-92

9:20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3008-B 16th Avenue West
Seattle, WA 98119
FAX: (206) 283-5044

DUPLICATE COPY

INVOICE # 92ACU0521-1

May 21, 1992

Alaskan Copper
628 South Hanford
Seattle, WA 98134

Re: Billing for the analyses of the environmental sample
submitted on May 15, 1992 from Project 7238, Acid Tank
Soil, PO# M24573 and reported to Gerald Thompson,
Project Leader.

1 soil sample analyzed for Total Metals by ICP Method 6010 @ \$135 per sample	\$ 135.00
1 soil sample analyzed for Nitrate and Fluoride @ \$45 per sample	45.00
1 soil sample analyzed for pH \$5 per sample	<u>5.00</u>
Amount Due	\$ 185.00

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James E. Bruya, Ph.D.
(206) 285-8282

3008-B 16th Avenue West
Seattle, WA 98119
FAX: (206) 283-5044

May 21, 1992

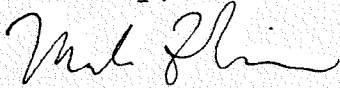
Gerald Thompson, Project Leader
Alaskan Copper
628 South Hanford
Seattle, WA 98134

Dear Mr. Thompson:

Enclosed are the results of the analyses of the sample submitted on May 15, 1992 from Project 7238, Acid Tank Soil, PO# M24573.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this material, or if you just want to discuss any aspect of your projects, please do not hesitate to contact me.

Sincerely,



Mark Z Perin, Chemist

MZP/sao

Enclosures